



## The Spatial Distribution of Tourist Sites in Samosir, North Sumatera

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### Abstract

The spatial distributions of tourist sites is one of basic components to formulating the tourism development policy based on their characteristics and promote tourist sites. GIS technology very helpful to develop many kinds of sectors including tourism sectors. This research aims to map the distribution of tourist sites in Samosir District. The data used are compiled from observation and survey. Furthermore, the data were analyzed using Arc GIS software to obtain the map of tourist sites in Samosir district. The results reveals that almost 75 tourist attractions spread in 9 subdistricts in Samosir. Distribution of most sites is located mostly in the subdistrict of Simanindo and least in Sitotio district. Tourism supporting infrastructure facilities such as hotels and other accommodations are also most in Simanindo district.

**Keywords:** Distribution, Tourist Sites, GIS

### Introduction

Samosir became one of the famous destination of tourism in Indonesia. Samosir offers natural attractions and a wealth of unique local culture to attract the tourists. Samosir regency keeps the history of Batak ethnic origin. Various relics of the history of the Batak kingdom be evidence of the past tribal life such as the Tomb of the King, Stone Trials and others. Not only that, in terms of culture also contribute to the development of tourism, especially the culture of Batak tribe such as custom events, ulos crafts and so forth. Natural attractions are distributed in every subdistrict in Samosir. However, not all potential objects are popular and visited by tourists.

Geographic information Systems (GIS) is one amongst the most outstanding technologic innovations in tourism designing and decision making. Both GIS and tourism share a typical characteristic, that is, each cross the boundaries of disciplines and application areas. GIS has been applied in several fields together with geography, forestry, urban development and designing, and environmental studies (Hermon, 2009; Baviskar, 2017; Hermon, 2017). GIS can be used in tourism as a decision supporting tool for sustainable tourism planning, impact assessment, visitor flow management, and tourism site selection. Therefore, the potential for GIS applications in tourism is significant. Geographic Information System (GIS) has been recognized as a useful tool by a wide range of disciplines in managing, storing, analyzing and visualizing the spatial and non-spatial data.

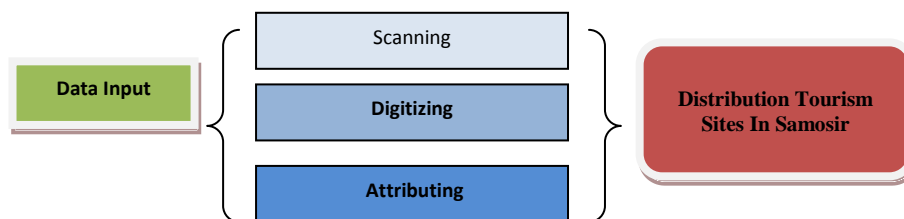
The outcomes of GIS analysis demonstrate the spatial visualization of the lodging evolution and geographical distribution trends within the study areas. This study provides tourism planners, local authorities, hotel entrepreneurs and potential developers with insights into the planning and constructing of new tourist accommodations according to potential development sites/areas (Othman *et al*, 2010; Hermon, 2010; Hermon, 2012). Tourism with its focus on travel movements and the transfer of peoples, goods and



services spatially and temporally is essentially a geographical phenomenon (Williams, 2009; Hermon, 2015; Hermon, 2016; Oktorie, 2017; Hermon, 2019). The tourist resources are spatially distributed across spaces in countries, and geographies, this entails understanding the spatial dimensions of tourism and geographical unpacking of the uneven patterns and distribution of resources as key socio-economic development (Rogerson, 2014; Hermon, 2016). Therefore, the purpose of this study is to map the spatial distribution of natural attractions, history and culture as well as the object of spiritual/religious tourism in Samosir District. From the result of this study, tourists can be more familiar with the distribution of sites throughout the District of Samosir. This of course can be used as a tourism promotion medium.

## Method

Qualitative approach are used in this research. The data are compiled from observation and survey. The research location covers 9 subdistrict namely Siotio, Simanindo, Pangururan, Sianjur Mula-mula, Harian, Nainggolan, Onanrunggu, Palipi, and Ronggur Nihuta. In each district, tourism inventory is then classified into several categories, namely (1) natural tourism (geophysical-landscape attraction, natural attraction); (2) historical tourism; (3) culture tourism; (4) religious tourism; (Department of Tourism, Art and Culture of Samosir District in BPS, 2016; Brown *et al.*, 2007). The coordinates of its area determined by using Global Positioning System. Furthermore, the spatial and attribute data were analyzed using Arc GIS software to produce the map of tourism sites in Samosir District. The research flow diagram can be seen in the following scheme:



**Figure 1.** Flow Diagram of Research

## Result and Discussion

There are 75 tourist sites spread in 9 subdistricts in Samosir District. Of these, as many as 39 objects (52%) are natural sites, 14 historical sites (18.67%), 9 cultural sites (12%), 12 historical and cultural sites (16%), and 1 spiritual attraction (0.013%). Most destinations are in Simanindo subdistrict and at least in Siotio subdistrict. Whereas tourism facilities are needed in the development of tourist destinations (Jovanovic, 2008). Tourist attraction would be of little value if its locations were inaccessible by transportation. Physical isolation and inadequate transport facilities are, clearly, handicaps to tourism. The following are the names of tourist sites per sub-district in Samosir District are grouped based on the type of tourist sites equipped with distribution map.

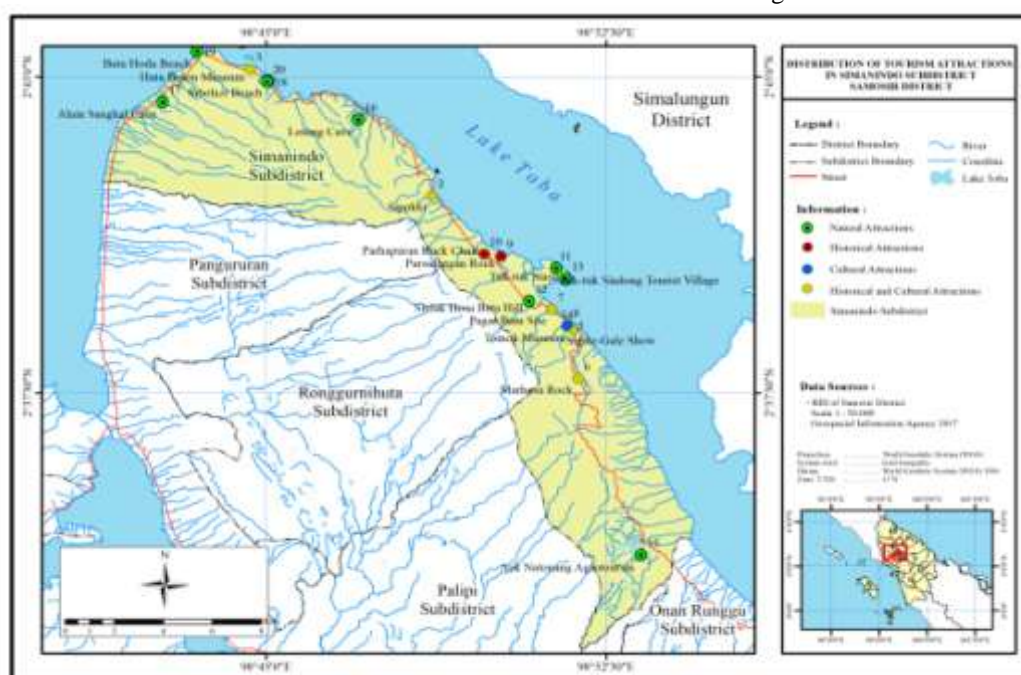
### Simanindo Subdistrict

Simanindo area is 198.20 km<sup>2</sup> (13.72% of the region of Samosir district). The capital of the sub-district is Ambarita. There are 58 hotels (1326 rooms) and other accommodation to support 19 tourist sites in this area. Only 1 hotel which is a 1 star hotel. Others, consist of 2 star hotels totaling 5 buildings; class I jasmine hotels amounted to 30 buildings; class II jasmine hotel amounted to 17 buildings; and class III jasmine hotel amounted to 5 buildings. Tourism sites in Subdistrict of Simanindo can be observed in Table 1 below:

**Table 1.** Distribution of Tourist Sites in Subdistrict of Simanindo

No	Name of sites	Type of sites	No	Name sites	Type of sites
1	Makam Raja Sidabutar	History and Culture	11	Desa Wisata Tuk-tuk Siadong	Natural
2	Sipokki	History and Culture	12	Siulak Hosa bukit Beta	Natural
3	Museum Huta Bolon	History and Culture	13	Tuk-tuk Siasu	Natural
4	Museum Tomok	History and Culture	14	Pulo Malau	Natural
5	Museum Gok Asi	History and Culture	15	Agrowisata Aek Naktonang	Natural
6	Batu Marhosa	History and Culture	16	Gua Lontung	Natural
7	Situs Pagar Batu	History and Culture	17	Gua Alam Sangkal	Natural
8	Pertunjukan Sigale-Gale	Culture	18	Pantai Sibolazi	Natural
9	Batu Parsidangan	History	19	Pantai Batu Hoda	Natural
10	Batu Kursi Parhapuran	History			

Distribution of the tourist sites in Simanindo Subdistrict showed in Figure 2 below :



**Figure 2.** Map of Distribution of Tourist Sites in Simanindo Subdistrict

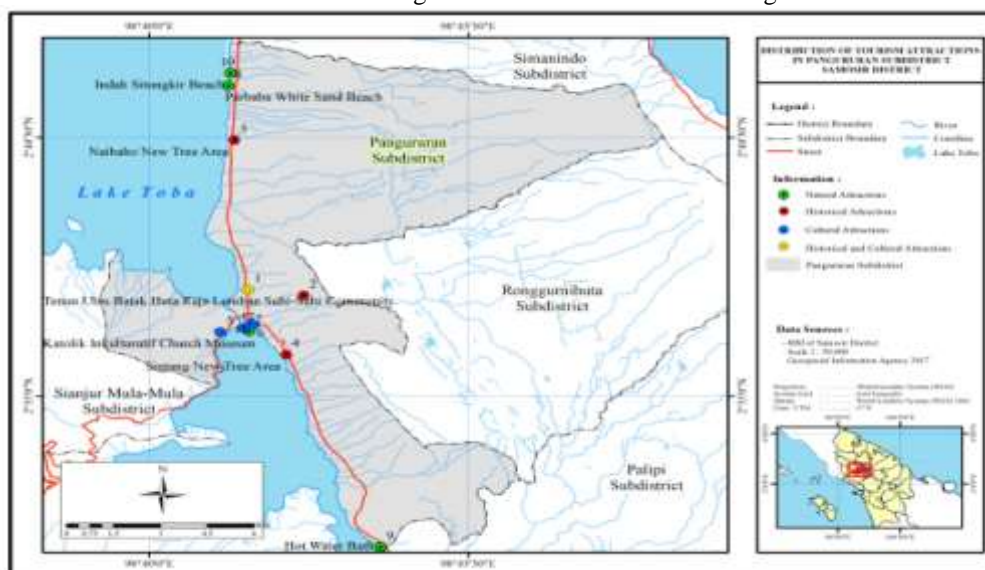
### Subdistrict of Pangururan

Its area is 121.43 km<sup>2</sup> with a capital subdistrict is Pangururan. There are 18 jasmine hotels (12 I-class jasmine hotels, 4 second-class jasmine hotels, 2 3-star jasmine hotels) with 315 rooms. Tourist sites in Pangururan subdistrict can be observed in Table 2.

**Table 2.** Distribution of Tourist Sites in Subdistrict of Pangururan

No	Name of Sites	Type of Sites	No	Name of Sites	Type of Sites
1	Komunitas Tenun Ulos Batak Huta Raja Lumban Suhi-Suhi	History and Culture	6	Monumen Perjuangan Liberty Malau	Culture
2	Sopo Paromasan Di Desa Lumban Pinggol	History	7	Kawasan Tano Ponggol	Natural
3	Kawasan Pohon Baru Naibaho	History	8	Pantai Pasir Putih Parbaba	Natural
4	Kawasan Pohon Baru Sinaetang	History	9	Pemandian Air Panas	Natural
5	Museum Gereja Katolik Inkulturatif	Culture	10	Pantai Indah Situngkir	Natural

Distribution of the tourist sites in Pangururan Subdistrict showed in Figure 3 below:



**Figure 3.** Map of Distribution of Tourist Sites in Pangururan Subdistrict

### Subdistrict of Sitiotio

Covers an area of 50.76 km<sup>2</sup> with capital of subdistrict is Sabulan. Sitiotio Subdistrict has no hotel or other accommodation that supports 3 tourist sites in this area. The sites can be observed in Table 3.

**Table 3.** Distribution of Tourist Sites in Sitiotio Subdistrict

No	Name of Sites	Type of Sites
1	Patung Raja Silontung	History and Culture
2	Mual Datu Parngongo	History
3	Mual Boru Saroding Desa Sabulan	History

Distribution of the tourist sites in Sitiotio Subdistrict showed in Figure 4.



**Figure 4.** Map of distribution of Tourist Sites in Sitiotio Subdistrict



### Subdistrict of Palipi

Its area of 129.55 km<sup>2</sup> with the capital of the subdistrict is Mogang. Its position is located on the west side of the lake adjacent to the Simanindo Subdistrict, on the east side of the lake. Tourist sites in this area are shown in Table 4 and Figure 5.

**Table 4.** Distribution of Tourist Sites in Palipi Subdistrict

No	Name of Sites	Type of Sites
1	Martua Limang di Desa Suhul Ni Huta Pardomuan Urat	History
2	Kawasan Wisata Gua Bunda Maria	Religion
3	Batu Rantai	Natural
4	Pemandian Air Panas Simbolon	Natural



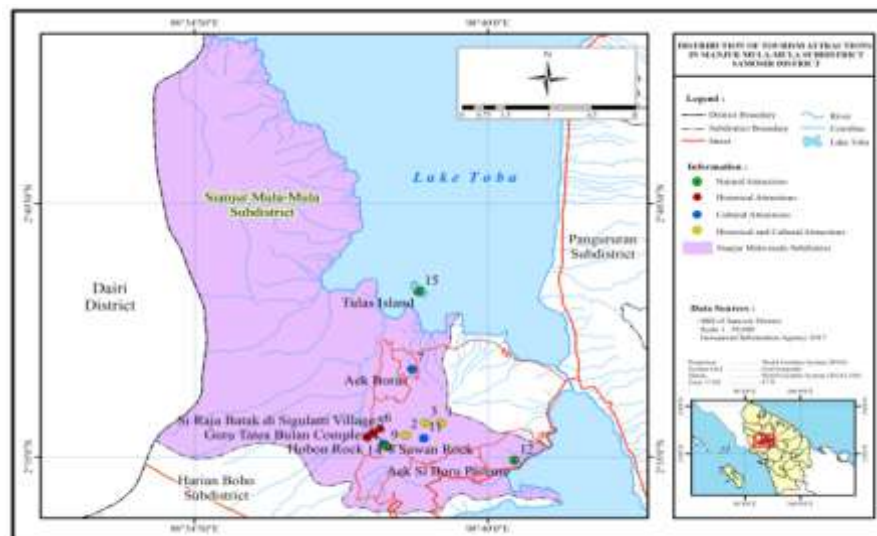
**Figure 5.** Map of Distribution of Tourist Sites in Palipi Subdistrict

### Subdistrict of Sianjur Mula-mula

The area of 140,24 km<sup>2</sup> with the capital of the subdistrict is Ginolat. The region is surrounded by hills and paddy fields. Pusuk Buhit is one of a hill peak in this region, 1972 masl (meters above sea level), based on the local mythology is believed to be the point of origin of Batak tribe originated. Sianjur Mula-mula has 15 tourist sites. List of sites in the Sianjur Mula-mula subdistrict can be observed in Table 5 and Figure 6.

**Table 5.** Distribution of Tourist Sites of Sianjur Mula-Mula Subdistrict

No	Name of Sites	Type of Sites	No	Name of Sites	Type of Sites
1	Pusuk Buhit (Batu Sawan, Tala, Tempat Doa)	History and Culture	9	Batu Parhusipan	Culture
2	Kawasan Peningalan Sejarah Huta Si Raja Batak	History and Culture	10	Batu Nanggar	Culture
3	Pemandian Aek Sipitu Dai	History and Culture	11	Batu Sawan	Culture
4	Batu Hobon	History	12	Aek Si Boru Pareme	Natural
5	Komplek Guru Tatea Bulan	History	13	Batu Holbung	Natural
6	Perkampungan Si Raja Batak di Sigulatti	History	14	Air Terjun Hadabuan Nasogo	Natural
7	Aek Boras	Culture	15	Pulau Tulas	Natural
8	Batu Pangarsipan	Culture			



**Figure 6.** Map of Distribution of Tourist Sites in Sianjur Mula-Mula Subdistrict

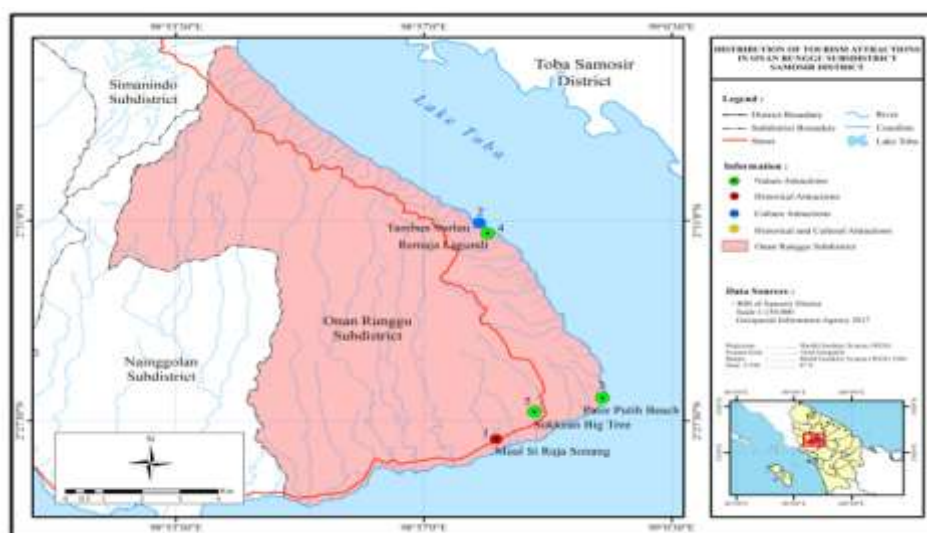
### Subdistrict of Onanrunggu

Covers an area of 60,89 km<sup>2</sup> with capital of subdistrict is Onanrunggu. This Subdistrict has a list of tourist attractions shown in table 6 and figure 7.

**Table 6.** Distribution of Tourist Sites in Onanrunggu Subdistrict

No	Name of Sites	Type of Sites
1	Mual Si Raja Sonang Di Pakpahan	History
2	Tambun Surlau	Culture
3	Pantai Pasir Putih Di Sukkean	Natural
4	Kawasan Wisata Remaja Lagundi	Natural
5	Pohon Besar Sukkean	Natural

Distribution of the tourist sites in Onanrunggu Subdistrict showed in figure 7 below :



**Figure 7.** Map of Distribution of Tourist Sites in Onanrunggu Subdistrict

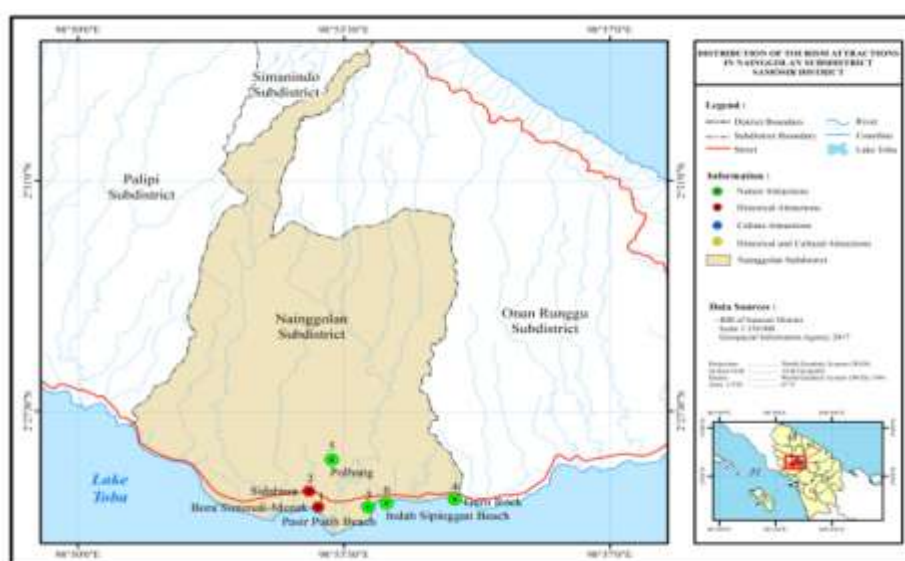
### Subdistrict of Nainggolan

The total area of 87,86 km<sup>2</sup>, with the subdistrict capital is Nainggolan. Tourist sites in this area are shown in Table 7 below.

**Table 7.** Distribution of Tourist Sites in Nainggolan Subdistrict

No	Name of Sites	Type of Sites
1	Boru Simenak-Menak	History
2	Sidabasa	History
3	Pantai Pasir Putih	Natural
4	Batu Guru	Natural
5	Polhang	Natural

Distribution of the tourist sites in Nainggolan Subdistrict Showed in Figure 8:



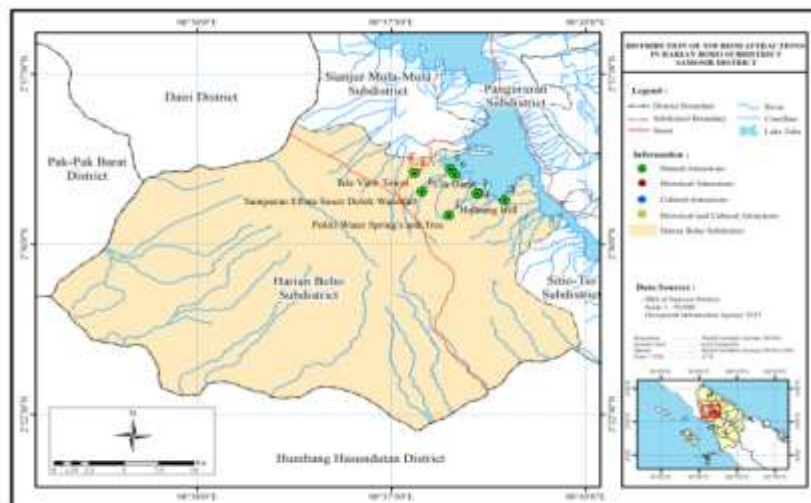
**Figure 8.** Map of Distribution of Tourist Sites in Onanrunggu Subdistrict

### Subdistrict of Harian Boho

Its total area is 560.45 km<sup>2</sup> (its territory is the widest compared to 8 other districts). The subdistrict capital is Harian Boho. Tourist destinations in this area are shown in Table 8.

**Table 8.** Distribution of Tourist Sites in Harian Boho Subdistrict

No	Name of Sites	Type of Sites
1	Air Terjun Sampuran Efrata Sosor Dolok	Natural
2	Menara Pandang Tele	Natural
3	Mata Air Dan Pohon Pokki	Natural
4	Kampung Harimau Situmeang	Natural
5	Ulu Darat	Natural
6	Hutan Flora Anggrek	Natural
7	Gua Parmonangan	Natural



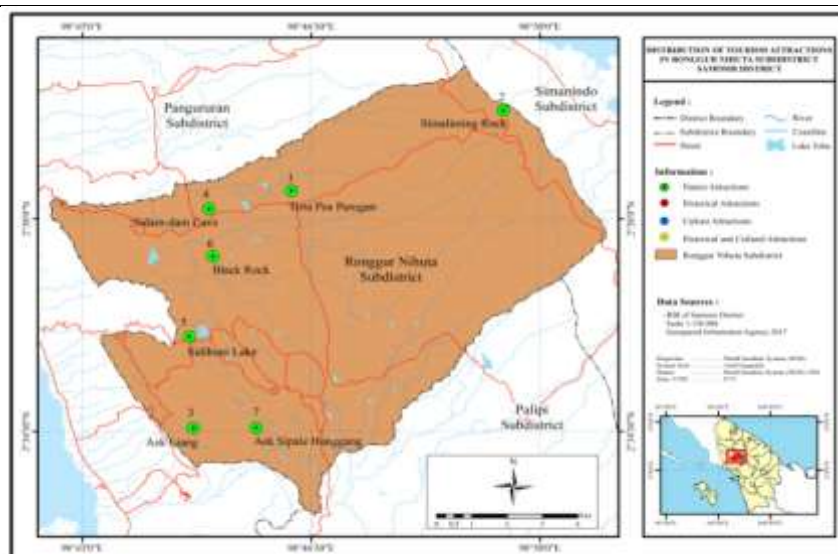
**Figure 9.** Map of Distribution of Tourist Sites in Harian Boho Subdistrict

### Kecamatan Ronggur Nihuta

Covers an area of 94,87 km<sup>2</sup> with capital of subdistrict is Ronggur Nihuta. All of tourist sites in Ronggur Nihuta Subdistrict are natural sites. This subdistrict has a list of tourist attractions shown in Table 9 and Figure 10

**Table 9.** Distribution of Tourist Sites in the Subdistrict of Ronggur Nihuta

No	Name of Sites	Type of Sites
1	Kawasan Wisata Tirta Pea Parogan Di Desa Salaon	Natural
2	Batu Simalliting	Natural
3	Aek Liang	Natural
4	Gua Sidam-Dam	Natural
5	Kawasan Wisata Tirta Danau Sidihoni	Natural
6	Batu Hitam	Natural
7	Aek Sipale Honggang	Natural



**Figure 10.** Map of Distribution of Tourist Sites in Ronggur Nihuta Subdistrict





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## Conclusion

There are 39 natural tourist attractions, 14 historical attractions, 9 cultural attractions, 12 historical and cultural attractions and 1 spiritual attraction/religion. Distribution of most attractions are in Subdistrict of Simanindo (19 attractions), and in Sianjur Mula-mula (15 attractions). While, the rest is in 7 other subdistricts; Pangururan (10 attractions), Harian (7 attractions), Ronggur Nihuta (7 attractions), Onanrunggu (5 attractions), Nainggolan (5 attractions), Palipi (4 attractions), and Sitiotio (3 attractions). Tourism supporting facilities such as hotels and other accommodation are located in subdistricts of Simanindo (58 star hotels and jasmine classes), 18 jasmine-class hotels in Pangururan Sub-district, 4 jasmine-class hotels in Nainggolan Sub-district and 2 jasmine-class hotels in Palipi Subdistrict. While in other subdistricts do not have accommodation facilities. Spatial knowledge and distributions of tourist sites should assist policy makers and service providers in market segmentation, planning, and product expansion to local and international tourists.

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